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ABSTRACT

This evaluation of the 1988-89 Instrumental Enrichment (IE) program in selected special education classrooms in Detroit (Michigan) found that the program was partially successful in achieving its goals. IE uses a series of paper-and-pencil exercises and follow-up discussions to increase participants' academic achievement, improve behavior, and return them to less restricted environments. A study sample of Emotionally Mentally Impaired (EMI) and Learning Disabled (LD) middle school students from IE classrooms was matched with a control group of special education students who had not been exposed to IE, and the groups were compared in terms of academic achievement, attendance, mainstreaming, and abstract thinking abilities. Teachers and parents were also surveyed about their perceptions of IE and its effects on participants. The following findings are presented: (1) participants did not improve their reading or mathematics achievement; (2) the effect of IE on abstract thinking abilities could not be determined; (3) the attendance of the LD participants improved significantly, but the attendance of the EMI participants did not; (4) the effect of IE on mainstreaming could not be determined; (5) teachers expressed positive attitudes toward IE and its effect on participants' behavior; and (6) parents reported positive changes in participants' behavior. Statistical data are presented in 15 tables. (FMW)

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EVALUATION OF THE INSTRUMENTAL ENRICHMENT PROJECT

1988-1989

Funded Under Public Law 94-142
Education for All Handicapped Children
and
Alternative to Special Education
(A State of Michigan Initiated Grant)

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August, 1989

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PROGRAM FACTS

Name of Program	:	Instrumental Enrichment Program
Funding Year	:	1988-89
Purpose of Program	:	To improve academic achievement, school related behaviors, and to return students to regular classroom environments
Features of Program	:	A series of paper/pencil exercises and follow-up discussions designed to promote thinking and the ability to solve problems. 'Bridging' activities are used to connect academic content study with life experiences.
Funding Source	:	Public Law 94-142 Education for all Handicapped Children and Alternative to Special Education--State Initiated Grant
Funding Level	:	$30,000
Number and Level of Participants	:	Approximately 760 special education students in various programs.
Number and Level of Schools in Program	:	42 Elementary, M[illegible]le, and High Schools; Special Educatio[illegible]Schools, TMI Centers, and School of Observation
Staffing Pattern	:	71 Instrumental Enrichment teachers and the Dynamic Assessment Support staff of approximately 67 that include the Mediated Learning Center specialists, school social workers, school psychologists, teacher consultants, teachers of the speech and language impaired, supervisors, administrators and a director
Instructional Time	:	Three to five 50 minute periods per week
Equipment & Materials	:	Instrumental Enrichment materials and Dynamic Assessment instruments
First Year Funded	:	1986
Program Director	:	Aleatha Hamilton

INSTRUMENTAL ENRICHMENT (IE)

(Executive Summary)

Purpose and Features

The project's purpose is to implement Instrumental Enrichment (IE) teaching methods and philosophy in selected special education classrooms. The IE program seeks to increase student participants' academic achievement in cognitive areas, to improve their school-related behaviors and to return them to less restricted environments. A series of paper/pencil exercises and follow-up discussions are used to help students gain insight into their own abilities to solve problems. 'Bridging' activities are used to connect academic content with life's experiences.

Evaluation Methodology

To measure the efficacy of the IE program, an attempt was made--that was largely successful--to match each experimental classroom and its program, e.g., Educable Mentally Impaired, with a control classroom: a special education classroom with the same program but in another school where IE teaching methods and philosophy were not installed. The project study sample was composed of Emotionally Mentally Impaired (EMI) and Learning Disabled (LD) middle school students. For each project objective, data were either collected from teacher records: achievement test scores, attendance counts, and mainstreaming information; or generated through the use of published instruments developed to assess changes in abstract thinking abilities. To measure the latter, the Cognitive Abilities Test [Chicago: Riverside Publishing Co., 1986] was used. To test for the statistical significance of the data, appropriate statistical procedures were used: the chi-square test, the t-test and the analysis of covariance test. Four of the project's six objectives hypothesized that the experimental students would show statistically significantly greater improvements than would the control students.

Findings and Recommendations

The summarized findings for each of the project objectives follow.

Objective 1: Increase academic growth in reading and mathematics. This objective was not achieved. There were no statistically significant pre-post differences in the performances of the two study groups in either special education program on the standardized achievement subtests administered in December, 1987 and December, 1988.

With the exception of the performance of the EMI experimental cohort on the math subtest, both study groups registered an increase in posttest mean scores over pretest mean scores, both in grade equivalent units.

Objective 2: Increase students' abstract thinking abilities. Complete data measuring this project objective will not be available until next year, when the study groups will be posttested on a cognitive abilities test. Pretest results show statistically significant differences on one subtest favoring EMI controls, but between the LD study groups, experimental students achieved statistically significantly higher mean scores on all three subtests. These pretest differences require that later evaluations of pre-post differences be statistically adjusted.

Objective 3: Reduce the frequency of absences from school. This objective was achieved in part. The LD experimental students were absent-from-school statistically significantly fewer days during the Fall, 1988 semester (the measuring period) than were LD control students. Among the EMI study cohorts, the controls were absent fewer days, but not statistically significantly so.

Objective 4: Increase the number of students enrolled in mainstream classrooms. The attainment of this objective cannot be assessed as mainstreaming appears to be a fairly ubiquitous practice at the middle school level as may be judged from the data gathered during the last two evaluations of IE. Among the control students in both special education cohorts, mainstreaming in one or more classes was experienced by all students. Ninety-three percent of the experimentals in both special education cohort shared the same experience.

Objective 5: Positive changes in teachers' attitudes toward IE instructional practices and teachers' perceptions of positive changes in students' behaviors will occur. Both parts of this objective were achieved. In measuring the former, teachers were asked to rate twenty-three IE instructional practices retrospectively: before and after their involvement with IE. Eighty-five percent or more of the teachers evaluated 18 of the 23 instructional practices either good or excellent in the post-involvement ratings phase. On all items, differences between pre-post ratings were statistically significant.

In the second part, teachers were asked to evaluate changes occurring in students' attitudes and behaviors during the school year. Seventy percent or more of the teachers answered affirmatively to positive changes occurring in 19 of the 34 behaviors rated. On only two did a higher proportion of teachers express either uncertainty or disagreement rather than agreement to positive changes occurring in student behavior during the school year.

Objective 6: Students' parents will report positive changes in students' behaviors. This objective was achieved. The results of telephone interviews found that eighty percent of the IE parents contacted said that they noticed positive changes occurring either sometimes or often on most of nine at-home student behaviors on which they were questioned. More specifically, this was true for five students behaviors among EMI parents and for eight student behaviors among LD parents.

Thus, the IE project partially succeeded in achieving this year's set of six objectives.

On the basis of a review of the project's performance during the last three years, the following recommendations are made:

1. The project should retain the same middle school study sample for the next two years, 1989-91.

2. The next comprehensive evaluation report should be issued at the end of the 1990-91 school year. This will allow the observation of the current study cohorts for a full three years.

3. There should be continuing efforts to improve the gathering and accurate recording of evaluation data.

4. Evaluation activity for Year IV should be devoted to monitoring the collection of data in four areas: academic growth, abstract thinking, locus of control, and attendance.

5. Finally, as recommended last year, this report should be reviewed by the program staff, and where needed, instructional and/or programmatic changes be developed and implemented for the IE program's improvement.

EVALUATION OF THE INSTRUMENTAL ENRICHMENT PROJECT

PROGRAM DESCRIPTION[1]

The Instrumental Enrichment Project's purpose is the implementation of Instrumental Enrichment teaching methods and philosophy in selected special education classrooms. Instrumental Enrichment[2] is a remedial intervention, pedagogical approach, grounded in a theory of cognitive modifiability, which seeks to induce changes of a structural nature, usually among low cognitive performance individuals.

IE posits the Mediated Learning Experience (MLE) model as the vehicle for achieving cognitive modifiability. Under MLE, a mediator interposes him/herself between the learner and the learner's environment and acts to interpret, select and structure phenomena for the learner, as well as the responses produced by the learner. This process assists the learner in developing responses modalities. Eventually, the learner is able to interact effectively with his/her environment without the need of mediation. In more specific detail, the program seeks to achieve the following subgoals: (1) the correction of deficient cognitive functions, and (2) the development of new habits that strengthen the use of intrinsic motivation, insights and reflective thinking and extinguish those behaviors characterized by a passive recipiency and reproduction of information. In three to five

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[1] Most of the program description presented here was first included in the 1986-87 evaluation report.

[2] Hereafter referred to as IE.

fifty-minute periods per week, students progress through a series of paper/pencil exercises with follow-up discussions designed to assist them to gain insight into their thinking and their feelings about their ability to solve problems. The IE project uses 'bridging' activities to connect academic content study with life experiences.

While students served by the IE program, during the 1988-89 school year, were enrolled in any one of eleven special education programs[3] at the elementary, middle and high school levels, the students selected to participate in the evaluation of the project were enrolled in two such programs: middle school level Educable Mentally Impaired and Learning Disabled.

At the project's beginning in Fall, 1986, IE was installed in 32 participating special education classes; by the end of the school year, in June, 1987, the total had reached 48. Concurrently, the number of special education students participating in the IE project evaluation grew from an early-in-the-year count of 365 to 545 by June, 1987.

During the project's second year of evaluation (1987-88), the number of participating special education classes as well as the number of program participants decreased. At the end of the school year, there were 23 special education classes designated as experimentals, i.e., where IE teaching philosophy and methods were employed, and another 27 special education classes identified as

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[3] See Table 1 for a listing of each program

controls i.e., where students received standard special education instruction.

In view of the problems that plagued the evaluation process during the project's first two years, to wit, inadequate numbers of student participants that often meant insufficient sample sizes for testing outcome hypotheses, one of the recommendations made in last year's evaluation report asserted that next year's evaluation design "narrow its field of operation to...middle schools in the Educable Mentally Impaired and Learning Disabled programs...."[4] The recommendation was implemented: Twelve Educable Mentally Impaired classes and 18 Learning Disabled classes were selected to participate in the 1988-89 evaluation. Half of the classes in each disability category, where IE was practiced, were designated as experimental, and the remained half of the classes, with no IE programs, served as controls.

Table 1 displays a comparison among the project's first three years of the number of classes participating in the evaluation. As noted above, there was a decrease in the number of experimental classes from 48 in Year I to 23 in Year II to 15 in Year III; for controls, the decrease was from 37 to 27 to 15. Trainable and Visually Impaired classes were not included after the first year in the evaluation design, and Hearing Impaired classes were not included after Year II. Elementary and high school level classes were also excluded from the program evaluation after Year II. The largest reduction in the number of classes participating in the

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[4] Denny Stavros, Evaluation of the Instrumental Enrichment Project, 1987-88, Detroit: Detroit Public Schools, 1988, p. 39.

TABLE 1

NUMBER OF CLASSES PARTICIPATING IN THE
EVALUATION OF THE IE PROJECT
BY SPECIAL EDUCATION PROGRAM AND PROJECT YEAR

Special Education Program Groups	Number Participating by Study Group and Project Year					
	Experimentals			Controls		
	Yr. I (86-87)	Yr. II (87-88)	Yr. III (88-89)	Yr. I (86-87)	Yr. II (87-88)	Yr. III (88-89)
Educable Mentally Impaired						
Elementary Level	3	2	-	3	2	-
Middle School Level	8	2	6	6	2	6
High School Level	2	0	-	2	2(c)	-
Learning Disabled						
Elementary Level	6	5	-	5	5	-
Middle School Level	10	7	9	10	7	9
High School Level	6	4	-	6	3	-
Emotionally Impaired						
Elementary Level	3	1	-	3	2	-
Middle School Level	2	1	-	0	2	-
Hearing Impaired						
Middle School Level	1(a)	1	-	1	2	-
Trainable	6	(b)	-	0	(b)	-
Visually Impaired	1	(b)	-	1	(b)	-
Total	48	23	15	37	27	15

(a) Two additional classes at the Day School for the Deaf participated.

(b) No Trainable or Visually Impaired classes were included in the evaluation of the IE program for the 1987-88 school year.

(c) These two classes were not included in the evaluation, since there were no comparison classes.

evaluation between program years occurred in Year II at the middle school level among the Educable Mentally Impaired. This, however, was reversed in Year III with a change in emphasis in the selection process. Eight experimental classes were reduced to two in Year II to be increased to six in Year III; among controls, corresponding class numbers were 6, 2, and 6.

It is with the Learning Disabled at the middle school level that class numbers remained stable for all three years. For both study groups, the numbers were the same over time: 10, 7, and 9. Yet even with these stable and adequate number of classes participating during the project's three year tenure, there was a woeful lack of continuity: Only 2 of the 9 experimental classes (in Year III) participated in all three years, and only 1 of 9 control classes (in Year III). One other experimental class participated in Year I and again in Year III. Thus, for the Learning Disabled group, there was severe limitation on the amount of measurement data developed in Year II that could be applied to Year III's evaluation.

Since there were only two classes of Educable Mentally Impaired in each study group in Year II, there was a structural limitation on the amount of data available from Year II. However, the two experimental classes and the one control class did participate for all three years.

The substantial decrease in the number of classes participating in the evaluation during Year II was reflected in fewer schools participating in both study groups. In Year III, there was a further reduction in the number of schools represented in the control group. There were 24 experimental schools in the

first year; 11 in the second year; and 12 in the third year. The 32 control schools in the first year were reduced to 21 in the second year and to 13 in the third year.

The decrease in the total number of classes and schools participating in the evaluation process is also reflected in fewer student participants. During Year I, there were 545 experimental and 294 control students participating for varying periods of time; in Year II, the totals were 319 experimental and 265 control students; and in Year III, a total of 199 experimental and 192 control students participated.

In addition to the 15 special education experimental classes participating in the Year III evaluation, there was another cohort of 27 special education classes using IE teaching philosophy and methods. Thus for the entire IE program, there was a total of 42 classes. These in turn were supported by Mediated Learning Center specialists, school social workers, school psychologists, teacher consultants, teachers of the speech and language impaired, supervisors, administrators and a program director. All of these selected support staff have been trained in the history, theory and practice of dynamic assessment, and the Learning Potential Assessment Device (LPAD), which is the companion assessment system of IE.

It should be noted that during Year III twelve bilingual staff persons received training as part of a collaborative effort to support the Bilingual Department's initiation of a dynamic assessment component.

The IE Project was funded under Public Law 94-142, Education for All Handicapped Children and Alternative to Special Education, a state initiated grant. The funding level for the 1988-89 school year was $30,000--the same amount as in Year II, but a considerable decrease from Year I's funding level of $100,000.

PURPOSE OF EVALUATION

To measure the efficacy of the IE project, a set of specific behavioral objectives was formulated that related to the improvement among student participants in cognitive areas, in-school behavior, and the return of students to regular education classes. Project goals and objectives are presented in the next section of evaluation methodology.

METHODOLOGY

The evaluation design called for the collection of data to test project efficacy on six project objectives.

Objective 1: Increase academic growth in reading and mathematics.

Method of Assessment: For each special education program, e.g., Educable Mentally Impaired, a comparison would be made between the scores attained by experimental students and those attained by control students on the standardized test they normally take, e.g., Stanford Diagnostic Test, December, 1987 and December, 1988. It was hypothesized that the gains made in both reading and mathematics by the experimental students would be greater than the gains made by control students.

Objective 2: To increase students' abstract thinking abilities.

Method of Assessment: For each special education program, a comparison would be made between the scores of experimental students and those of control students on a Cognitive Abilities Test. Pretest administration would be completed by April, 1989. Posttest administration will be completed by April, 1990. It was hypothesized that the gains made by the experimental students would be greater that the gains made by control students.

Objective 3: To reduce the frequency of absences from school.

Method of Assessment: For each special education program, a comparison would be made between the mean number of days experimental students were absent-from-school with the mean number of days control students were absent-from-school for the fall semester 1987. It was hypothesized that the experimental students would be absent, on the average, fewer days.

Objective 4: To increase the number or students enrolled in mainstream classroom.

Method of Assessment: For each special education program, a comparison would be made between the experimental group and the control group in the number of students enrolled in one or more mainstream classes for the fall semester of 1988. It was hypothesized that a greater number of experimental students would be enrolled in mainstream classes.

Objective 5: Positive changes in teachers' attitudes toward IE instructional practices and teachers' perceptions of positive changes in students' behavior would occur.

Method of Assessment: IE teachers would complete two questionnaires. The first asks teachers to rate IE instructional practices before their participation in IE and after. The second questionnaire focuses on teachers' perceptions of changes in students' behaviors that would occur during the school year. The survey was to be conducted in May, 1989. It was hypothesized that the responses of teachers would become positive toward IE instructional practices, and the reports of students behavioral changes would also be positive.

Objective 6: The students' parents would report positive changes in students' behaviors.

Method of Assessment: A randomly selected sample of parents would be interviewed via telephone. The questions asked would focus on behavioral changes occurring during the current school year. The interviewing would take place May, 1989. It was hypothesized that parents would report improvements by IE students in a variety of at-home behaviors.

One additional objective relating to increased control over events effecting one's life was deferred until the beginning of Year IV, when the School Attitude Measure (SAM) will be administered in October, 1989.[5]

PRESENTATION AND ANALYSIS OF DATA

The numbers of experimental and control students who participated in the project are displayed in Table 2 as enrollments at two time intervals: December, 1988 and June, 1989, and as retentions, i.e., participants enrolled in both December and June, by special education program. Overall, 89 percent of the experimentals and 86 percent of the controls remained in the project. This is an increase over Year II, and this also suggests that the decision to narrow IE sample selection to middle school special education students in the Educable Mentally Impaired and

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[5] Initially, Year III's evaluation design called for the administration of the SAM in October, 1988. This would have provided for a fall-to-fall comparison of student attitudes, i.e., Fall, 1987 with Fall, 1988. The results from spring-to-fall administration of the SAM in Year II were much less than anticipated: 80 percent of the posttest means were either below or equal to pretest means. Discussions with the SAM's authors established that the scores obtained were not unusual given a fall-to-spring administration of the SAM. (See discussion in last year's evaluation report, op.cit., pp. 26, 28-29, and 34). However, because of the limited number of classes from Year II participating in Year III's evaluation, the high rate of student attrition--only 15 Year III experimental and 10 Year III control student participants had taken the SAM in 1987, and process of selecting teachers and their classes to participate in the evaluation was not completed until November, 1988, the pretest administration of the SAM was rescheduled for October, 1989.

TABLE 2

STUDENTS PARTICIPATING IN THE IE PROJECT:
NUMBER AND PERCENT OF EXPERIMENTALS AND CONTROLS
ENROLLED IN DECEMBER, 1988 AND JUNE, 1989 AND RETAINED[1]
BY SPECIAL EDUCATION PROGRAM
1988-89 SCHOOL YEAR

Special Education Program Groups	Numbers Participating by December, 1988 and June, 1989 Enrollments, and Numbers Retained per Study Group					
	Experimentals					
	Enrolled December, 1988		Enrolled June, 1989		Retained	
	N	Percent	N	Percent	N	Percent[2]
Educable Mentally Impaired	55	31%	52	30%	48	87%
Learning Disabled	121	69	124	70	109	90
Total	176	100	176	100	157	89

Special Education Program Groups	Numbers Participating by December, 1988 and June, 1989 Enrollments, and Numbers Retained per Study Group					
	Controls					
	Enrolled December, 1988		Enrolled June, 1989		Retained	
	N	Percent	N	Percent	N	Percent[2]
Educable Mentally Impaired	44	28%	48	30%	40	91%
Learning Disabled	115	70	114	70	97	84
Total	159	100	162	100	137	86

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[1] Students who were enrolled in December, 1988 and remained as of June, 1989

[2] Percent of the number enrolled in December, 1988

Impaired and Learning Disabled programs was appropriate.[6] It remains to be seen if the summer recess will adversely effect the stability of the study samples.

Academic Growth in Reading and Math

The first of the project's six program goals: experimental students would outperform control students in academic skills, as measured by reading and mathematics tests, was not realized. To test for differential growth between the two study groups in the two academic skills, an analysis of covariance statistical procedure was used. This procedure tests for the significance of posttest differences while controlling for the effects of unequal pretest results. Tables 3 and 4 display pre- and posttest mean scores on both the reading and mathematics subtests of the Stanford Diagnostic Test for each program-study group as well as the F values derived from analysis of covariance testing. None of the F values is statistically significant at the .05 level.

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[6] The retention rates among middle school participants for Years II and III, respectively, were:

	Year II	Year III
Educable Mentally Impaired		
Experimentals	80%	87%
Controls	34	90
Learning Disabled		
Experimentals	61	91
Controls	58	84

The retention rate for Year II was determined by dividing the greater number of students taking both pre- and posttest SAM or taking both pre- and posttest LPAD (Learning Potential Assessment Device) by the total number of students enrolled during the program year.

TABLE 3

MEANS OF PRETEST (DECEMBER, 1987) AND POSTTEST (DECEMBER, 1988) SCORES IN GRADE EQUIVALENT UNITS ON THE STANFORD DIAGNOSTIC READING AND MATHEMATICS SUBTESTS (FORM A, GREEN LEVEL) AND F VALUES FOR EXPERIMENTAL AND CONTROL STUDENTS PER SPECIAL EDUCATION PROGRAM

Special Education Program Groups	Pre and Posttest Mean Scores, Number or Students and F Values per Study Group						
	Reading						
	Experimentals			Controls			F Values*
	(N)	Pre $\bar{X}$	Post $\bar{X}$	(N)	Pre $\bar{X}$	Post $\bar{X}$	
Educable Mentally Impaired	(14)	3.1	3.5	(9)	2.5	2.9	.004
Learning Disabled	(21)	3.3	4.1	(33)	2.9	3.4	1.693

Special Education Program Groups	Pre and Posttest Mean Scores, Number or Students and F Values per Study Group						
	Mathematics						
	Experimentals			Controls			F Values*
	(N)	Pre $\bar{X}$	Post $\bar{X}$	(N)	Pre $\bar{X}$	Post $\bar{X}$	
Educable Mentally Impaired	(14)	3.1	2.7	(8)	3.1	3.2	.792
Learning Disabled	(24)	4.0	4.9	(32)	3.5	3.9	1.731

*None of the F values was statistically significant at the .05 level.

TABLE 4

MEANS OF PRETEST (DECEMBER, 1987) AND POSTTEST (DECEMBER, 1988) SCORES IN GRADE EQUIVALENT UNITS ON THE STANFORD DIAGNOSTIC READING AND MATHEMATICS SUBTESTS (FORM A, RED LEVEL) AND F VALUES FOR EXPERIMENTAL AND CONTROL EDUCABLE MENTALLY IMPAIRED STUDENTS

Standford Diagnostic Subtests	Pre and Posttest Mean Scores, Number or Students and F Values per Study Group						
	Experimentals			Controls			F Values*
	(N)	Pre $\bar{X}$	Post $\bar{X}$	(N)	Pre $\bar{X}$	Post $\bar{X}$	
Reading	(11)	2.0	2.6	(11)	2.2	2.6	.137
Mathematics	(12)	2.3	2.3	(13)	2.4	2.7	2.266

*None of the F values was statistically significant at the .05 level.

It should be noted that pre- and posttest scores were available for just over half of both experimental and control EMI (Educable Mentally Impaired) students and between one-fourth (experimental) and one-third (control) LD (Learning Disabled) students.[7] This was due to the absence of pretest data. Students newly promoted to middle school, at the beginning of the current school year, were tested on the Assessment of Basic Curriculum Skills Test (ABCS) as elementary school students. No equating of the ABCS to the Student Diagnostic Tests exists. Another proportion of pretest scores could not be retrieved for other reasons: no records could be located because of transfers, test records were missing, etc. Since all scores were not reported in raw score format as requested, the raw scores were converted to grade equivalent units and combined with the smaller number in that format to increase the sample of pre- and posttest scores. Lastly, it is instructive to note that both study groups save the experimental EMI on the math Green Level Subtest showed an increase in the posttest mean score over the pretest mean score.

Abstract Thinking Abilities

The evaluation design called for the assessment of the project's second objective to be based on pre- and posttest test data collected in April, 1989 (pretest) and in April, 1990 (posttest). It was hypothesized that experimental students should show significantly greater growth than control students in the

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[7] Hereafter EMI and LD will be used to refer to Educable Mentally Impaired and Learning Disabled, respectively.

TABLE 5

PRETEST MEANS OF SCORES IN STANDARD AGE UNITS OF EXPERIMENTAL AND CONTROL STUDENTS ON THREE SUBTESTS OF THE COGNITIVE ABILITIES TEST[1] FORMS D AND E ADMINISTERED IN APRIL, 1989 AND t-TEST VALUES PER SPECIAL EDUCATION PROGRAM

Study Groups	Educable Mentally Impaired Students					
	Means of Pretest Scores by Cognitive Abilities Subtest, Form D and t-Test Values					
	(N)	Verbal	(N)	Quantitative	(N)	Nonverbal
Experimental	(56)	54.8	(54)	49.9	(54)	59.2
Control	(44)	56.9	(44)	55.9	(44)	61.8
t-Test Values		.72		2.04[2]		.72

Study Groups	Learning Disabled Students					
	Means of Pretest Scores by Cognitive Abilities Subtest, Form D and t-Test Values					
	(N)	Verbal	(N)	Quantitative	(N)	Nonverbal
Experimental	(100)	73.0	(97)	73.2	(98)	80.3
Control	(88)	65.8	(84)	66.1	(78)	75.2
t-Test Values[3]		5.94		4.10		2.83

[1] The Riverside Publishing Co., 1986

[2] Significant at the .05 level.

[3] All three t values were significant at the .01 level.

area of abstract thinking ability. Table 5 displays the means of the pretest scores by program and study group from the April, 1989 administration of the Cognitive Abilities Test. [Test results from one experimental LD class and one control LD class had not been received by the end of the school year, and thus were not included in the data presented above].

Notwithstanding incomplete prescribed preposttest assessment measure data, it is of interest to consider the April, 1988 performance of the study groups. As may be seen in Table 5, the control students, among the EMI cohort, did achieve higher mean scores converted to standard age units than did the experimental students, and on the Quantitative Subtest the t value was statistically significant.

However, within the cohort of LD students, the mean scores of the experimentals in standard age units on all three subtests were statistically significantly higher than those achieved by the controls.

It, of course, remains to be seen, if the LD experimental students will continue to outperform their study group opposites.

Absences from School

The project's third object hypothesized that the experimental students would be absent-from-school fewer days than control students. Fall, 1988 semester data are displayed in Table 6 for each program-study group. Among the EMI cohort, control students were on-the-average out from school less often then experimental students, 13.4 days as compared to 17.6 days, but the difference was not statistically significant. Among LD students the opposite

TABLE 6

MEANS AND t-TEST VALUES IN THE COMPARISON OF THE NUMBER OF DAYS ABSENT DURING THE FALL, 1988 SEMESTER FOR EXPERIMENTAL AND CONTROL STUDENTS PER SPECIAL EDUCATION PROGRAM

Special Education Program Groups	Means of the Number of Days Absent, Number of Students per Study Group and t-Test Values				
	Experimentals		Controls		t-Test Values
	(N)	$\bar{X}$	(N)	$\bar{X}$	
Educable Mentally Impaired	(55)	17.6	(46)	13.4	1.22
Learning Disabled	(109)	13.4	(115)	19.6	3.05*

*The t value was statistically significant at or below the .01 level.

TABLE 7

MEANS AND F VALUES IN THE COMPARISON OF THE NUMBER OF DAYS ABSENT DURING THE FALL, 1987 AND THE FALL, 1988 SEMESTERS FOR EXPERIMENTAL AND CONTROL STUDENTS PER SPECIAL EDUCATION PROGRAM

Special Education Program Groups	Means of the Number of Days Absent and Number of Students per Study Group and F Values						
	Experimentals			Controls			
	(N)	Fall, 1987 $\bar{X}$	Fall, 1988 $\bar{X}$	(N)	Fall, 1987 $\bar{X}$	Fall, 1988 $\bar{X}$	F Values*
Educable Mentally Impaired	(24)	17.6	21.9	(27)	14.8	13.3	1.52
Learning Disabled	(55)	13.4	11.3	(70)	22.2	19.1	1.40

*None of the F values was statistically significant at the .05 level.

obtained. The mean number of days experimental students were absent-from-school was 13.4, and the mean number of days control students were out was 19.6. This difference was statistically significant.

Thus, for one of the two program groups, the objective of fewer absences was achieved. It is instructive to define the objective as an improvement in attendance and focus on change over time. By comparing Fall, 1988 absences-from-school while controlling for previous behavior: absences-from-school for the Fall, 1987 semester it is possible to gain a measure of an historical dimension to this form of student behavior. These data are presented in Table 7, albeit for many fewer students than are accounted for in Table 6. As may be observed in Table 7, EMI experimental students were absent on the average more days in the Fall of 1988 than in the Fall of 1987. For LD experimentals and for both control program cohorts the opposite was true: Fewer average days absent-from-school were recorded for the Fall, 1988 semester than for the Fall, 1987 semester. A statistical treatment of these data, using the analysis of covariance test, resulted in F values that were not statistically significant.

Students Mainstreamed

The fourth program objective hypothesized that a greater number of experimental students would be placed in one or more mainstream classes during the year than would control students. However, the decision at the outset of Program Year III to limit the study sample in the evaluation of the IE program to EMI and LD middle school classes, based on recommendations made in the

previous year's evaluation report[8], inadvertently nullified the value of the objective as a measure of project efficacy.

During Year II of the evaluation, the two program groups with the exact same percentage of experimental and control students mainstreamed: 100 percent of the EMI and 96 percent of the LD, occurred among the middle school cohort. This same tendency was found to exist during the 1986-87 program year among the experimental EMI middle school cohort (100 percent mainstreamed) and the experimental LD middle school cohort (89 percent mainstreamed). No data had been provided on control group mainstreaming.

The above is an historical prolegomenon to the presentation of data bearing on the project's performance this year in mainstreaming students. Fifty out of 54 or 93 percent of the EMI experimental students and all of the 47 EMI control students reported, were in one or more mainstream classes. Among the reported LD cohort, 95 to 102 or 93 percent of the experimental and all 106 of the controls were mainstreamed.

Thus, from the perspective of experimental design, this was a hollow objective, and because of historical circumstances, it was less than adequate.

Teacher Attitudes

The fifth project objective focused on positive changes in teacher attitudes and feelings toward IE instructional practices

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[8] See the discussion on page 3 above.

and on teacher perceptions of changes in students' behaviors that occurred during the school year. Two questionnaires developed during Year I to assess a similar objective were employed. There were some slight changes in the wording of some items and additional questions were included.

Teacher Attitudes Towards Aspects of the Program

The first of the questionnaires measuring changes in teachers' attitudes toward IE instructional practices was composed of twenty-three closed-end items, each related to an aspect of IE, with a six-point rating scale (0 = unable to rate to 5 = excellent) following each item, plus eleven additional items, six of which were either open-ended questions or follow-ups for explanations to questions with a yes/no choice format. The teacher respondents were asked to rate each of the 23 program practices from two perspectives: before involvement in IE and after. Accordingly, each respondent was instructed that ratings "...should represent the direction and magnitude of change in [his/her] classroom behavior over time."

Table 8 presents the means of the teacher ratings and the combined percents of good or excellent ratings for the 23 program practices, before and after IE involvement. For the purpose of statistically analyzing the differences between before and after (involvement) ratings--using the six-point scale--on each of the 23 items, the t-test was used to determine statistical significance. For all twenty-three program practices, the difference between the means of pre-program participation ratings and the means of the post-program involvement ratings were

TABLE 8

MEANS OF RATINGS AND PERCENTS OF TEACHERS RATING VARIOUS IE INSTRUCTIONAL PRACTICES AS "GOOD" OR "EXCELLENT" BEFORE AND AFTER PROGRAM PARTICIPATION AND t-TEST VALUES

IE Instructional Practices	Means of Ratings and Percents of Teachers Awarding "Good" or "Excellent" Ratings per Time of Participation and t-Test Values				
	Time of Participation				
	Before		After		
	$\bar{X}$	%	$\bar{X}$	%	t-Test Values*
Planning for lessons	3.4	57.9%	4.1	86.8%	5.49
Introduction of lessons	3.4	52.6	4.2	89.5	6.28
Teaching of vocabulary to students	3.3	42.1	4.3	94.7%	7.35
Giving instructions	3.7	68.4	4.4	94.7%	6.47
Generalizing dialogue and discussion	3.4	50.0	4.4	86.8%	6.98
Using mediated learning	2.8	28.9	4.0	78.9%	8.85
Analyzing student tasks	3.4	50.0	4.1	92.1%	6.28
Students knowing answers without being told	2.6	21.1	3.7	76.3%	7.22
Discussing problem solving with students	3.2	39.5	4.4	92.1%	9.20
Remediation of cognitive deficiencies	2.9	26.3	4.0	78.9%	4.78
Style of teaching	3.8	76.3	4.4	92.1%	5.96
Effectiveness of teaching	3.7	65.8	4.2	92.1%	5.96
Enthusiasm for teaching	3.3	71.1	4.4	89.5%	4.57

*All t values were significant below the .01 level.

TABLE 8 CONTINUED

IE Instructional Practices	Means of Ratings and Percents of Teachers Awarding "Good" or "Excellent" Ratings per Time of Participation and t-Test Values				
	Time of Participation				
	Before		After		
	$\bar{X}$	%	$\bar{X}$	%	t-Test Values*
Motivation for improving instruction	3.8	76.3	4.5	94.7	5.21
Self-confidence in assisting students to improve their functioning	3.7	60.5	4.5	97.4	6.57
Use of my own vocabulary during lessons	3.3	52.6	4.2	92.1	5.16
Bridging concepts to subject content and life experiences	2.9	28.9	4.4	92.1	8.53
Understanding why IE instruction is effective	2.3	15.8	4.2	89.5	8.19
Estimation of student ability	3.4	47.4	4.3	94.7	7.58
My teaching abilities	3.8	73.3	4.4	94.7	5.96
Insights into student's cognitive deficiencies	3.1	31.6	4.2	84.2	9.91
Networking among teachers	3.2	44.7	3.7	65.8	4.97
Estimation of student's capacity for change	3.2	47.4	4.2	86.8	8.38

*All t values were significant below the .01 level.

statistically significant below the .01 level. (See Table 8.) The direction of each of the 23 ratings over time was positive, i.e., from a scale value of fair or fair-plus to a scale value of good-plus on the overwhelming majority of items. Eighteen of the

23 practices were rated good or excellent by a minimum of 85 percent of the teachers in the post-program involvement section. On only one item did less than three-fourths of the raters give a good or excellent rating and that was for the networking among teachers practice. Thus, the first half of the objective was achieved.

A comparison between the ratings of those who were first-year teachers in Year III with the ratings of teachers in Year I, for both pre-participation and post-participation ratings, reveals consistently lower percents choosing good or excellent among the former group. A comparison between the two groups on the number of program practices rated either good or excellent in the pre-participation section using a 50 percent cutoff, and a comparison between the two groups in the post-participation ratings using an 85 percent cutoff yielded results that were not statistically significant.[9]

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[9] A chi-square statistic was computed for each of the following tables. Neither was significant at the .05 level:

Pre-Participation Ratings

Raters: First Year Teachers	Number of Items Rated Good or Excellent by Percent of Raters: < 50 percent	> 50 percent	Total
Year I (N=28)	8	15	23
Year III (N-17)	14	9	23
	X^2=2.18 df=1	P=NS	

Post-Participation Ratings

Raters: First Year Teachers	Number of Items Rated Good or Excellent by Percent of Raters: < 85 percent	> 85 percent	Total
Year I (N=28)	2	21	23
Year III (N-17)	6	17	23
	X^2=1.36 df=1	P=NS	

Before leaving Year III teachers' ratings of the 23 program practices, mention should be made of those practices where the spread in percentage points between pre-participation means and post-participation means was 50 percentage points or greater. These were:

- Understanding why IE instruction is effective
- Bridging concepts to subject content and life experiences
- Insight into student's cognitive deficiencies
- Students knowing answers without being told
- Discussing problem solving with students
- Remediation of cognitive deficiencies
- Teaching of vocabulary to students
- Using mediated learning

The responses on the additional open-ended questions provide support to a picture of modified and improved instructional practices once teachers participate in IE. Approximately 90 percent acknowledged that mediated learning changed the way they instruct. An equal proportion felt that the use of IE has made them a better teacher. Eighty-one percent said that the use of IE changed the way they interact with students.

The responses of the teachers to a final question bearing on the efficacy of the IE in teaching content reflects one of the apparent weaknesses of IE. To the question "How much of a difference does IE make in comparison to the regular special education program on student learning in the content areas?", approximately one-third answered very much and another one-fourth answered much. The remaining two-fifths were less positive. Of

those answering very much, the difference was considerable between first-year teachers (Year I), 19 percent, and third-year teachers (Year III), 57 percent. Achievement test data from Year II and Year III strongly support those who felt IE made little difference in comparison to the regular program in the teaching of content.[10]

Teacher Attitudes: Changes in Student Behavior

The responses of teachers to a second questionnaire, measuring perceived changes in student behavior, are presented in Table 9. The instrument is composed of 34 items, all closed-end with a five-point Likert-type rating scale (SA=Strongly Agree to SD=Strongly Disagree). The items are presented in three groupings: (a) attitudinal changes, (b) various behavioral and motivational changes, and (c) changes in the skills acquired by students. The percents answering either Strongly Agree and Agree were combined and the percents answering Strongly Disagree and Disagree were combined for display in Table 9.

By inspection, it is manifestly evident that the second part of Objective 5 was achieved. In all areas measured, teacher agreement proportions were overwhelmingly greater than teacher disagreement proportions.

For the initial grouping of items dealing student attitudes, large percents of teachers were in agreement that there were positive changes in student attitudes toward self, attitudes toward their own abilities, and in their approach to problems.

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[10] See Table 5, in last year's report, op. cit., p. 15; Tables 3 and 4, above.

In the second grouping of items relating to various behavioral and motivational changes, large percents of teachers agreed that students showed improvements in self-concept and self-confidence and in increased time-on-task.

Among the majority of items related to student skills, large percents of teachers agreed that students were making significant changes in settling down and concentrating, listening to the opinions of others, taking risks in offering answers, asking for information or clarification, increasing their vocabularies, participating in increased dialogue and discussion, and offering help to other students.

There was greater uncertainty and disagreement than agreement among teachers regarding improvements in student attendance and punctuality and in the increased spontaneous use of the dictionary by students.

The responses of teachers in Year I to the same set of questions were generally more positive, i.e., the percents of agreement were higher. But it should also be noted that there were similarly higher or equal percents not in agreement on positive student changes in improved attendance and punctuality and in the spontaneous use of the dictionary by students.

TABLE 9

PERCENTS OF TEACHER LEVELS OF AGREEMENT
WITH POSITIVE CHANGES IN VARIOUS
STUDENT ATTITUDES AND BEHAVIORS (N=38)

Student Attitudes and Behavior	Percents of Teacher Responses		
	Agree	Uncertain	Disagree
I. As a result of the Instrumental Enrichment Program, there has been a positive change in students'...			
1. attitude toward school in general.	65.8%	28.9%	5.3%
2. attitude toward authority.	57.9	31.6	10.5
3. attitude toward self.	92.1	2.6	5.3
4. attitude toward own abilities.	86.8	10.5	2.6
5. attitude toward peers.	68.4	28.9	2.6
6. approach to problems.	84.2	13.2	2.6
II. There have been changes in student behavior that would suggest...			
7. improved self-concept.	89.5	7.9	2.6
8. increased motivation for learning.	76.3	18.4	5.3
9. improved enthusiasm for learning.	71.1	23.7	5.3
10. improved self-confidence.	89.5	7.9	2.6
11. increased time-on task.	81.6	13.2	5.3
12. reduced number of undesirable incidents.	63.2	31.6	5.3
13. improved attendance.	39.5	42.1	18.4
14. improved punctuality.	47.4	39.5	13.2

TABLE 9 CONTINUED

Student Attitudes and Behavior	Percents of Teacher Responses		
	Agree	Uncertain	Disagree
III. There have been significant changes in the skills acquired by the students in the area of...			
A. Improved study habits.			
15. Students create a plan to complete a task.	57.9%	31.8	5.3%
16. Students check and correct their own work.	71.1	21.1	7.9
17. Students settle down and concentrate.	84.2	7.9	7.9
B. Increased time-on-task.			
18. Students show reluctance to stop working.	71.1	13.2	15.8
C. Increased thinking behavior.			
19. Students talk about thinking and problem solving.	76.3	15.8	7.9
20. Students listen to the opinions of others.	86.8	10.5	2.6
21. Students give spontaneous suggestions.	78.9	13.2	7.9
D. Increased questioning behavior.			
22. Students ask questions about explanations.	78.9	18.4	2.6
23. Students take risks in offering an answer.	89.5	5.3	5.3
24. Students ask for information or clarification.	84.2	15.8	0.0

TABLE 9 CONTINUED

Student Attitudes and Behavior	Percents of Teacher Responses		
	Agree	Uncertain	Disagree
E. Increased language usage.			
25. Students have increased vocabulary.	84.2%	10.5%	5.3%
26. Students use new vocabulary in new contexts during the day spontaneously.	68.4	26.3	5.3
27. Students have precision in the use of language.	57.8	31.6	10.5
28. Students participate in increased dialogue and discussion.	84.2	10.5	5.3
F. Increased spontaneous application of abilities in other contexts.			
29. Students make a relationship at an unexpected moment.	76.3	15.8	7.9
30. Students use a dictionary spontaneously.	47.4	23.7	28.9
31. Students show curiosity rather than acceptance.	71.1	23.7	5.3
32. Students volunteer for new tasks.	78.9	15.8	5.3
33. Students spontaneously make connections.	57.9	34.2	7.9
34. Students offer to help other students.	97.4	2.6	0.0

Parents' Report of Positive Changes in Students' Behaviors at Home

The sixth and last project objective was the report by parents of positive changes in a variety of at-home behaviors of IE students. Although not initially scheduled to be a part of the evaluation design, the interviewing of a sample of control parents was deemed appropriate for purposes of comparison, and was thus conducted.

From a listing of all middle school students currently enrolled (May, 1989) in EMI and LD special education classes, a random selection procedure was used to select samples of experimental and control students per special education program.

Using the telephone numbers provided on the student listings, interviewers called parents during the day. Because of disconnected telephones, no initially listed numbers, and no answers after repeated calls--a certain proportion of parents were employed during the day, the sample lists of student names as well as the universe of names of middle school special education students were exhausted without the projected sample totals fulfilled. The proportions of parents interviewed via telephone vis-a-vis the universe of names on the student enrollment rosters were one-fourth of both LD study groups and EMI experimentals, respectively, and one-third of the EMI controls.

The interview schedule contained thirteen forced-choice and two open-ended items. Essentially this was the same instrument as was used in the Year I evaluation, and because of the inclusion of control parents, two program evaluation questions were revised for the control group edition. In addition, both sets of parents were asked about their child's progress during the current school year

rather than asking experimental parents to respond in term of their child's tenure in the IE program.

Reports of IE Parents

On three of the nine student at-home behaviors about which parents were questioned, seventy percent or more of the EMI and LD parents indicated that they had often noticed positive changes. For five of the nine behaviors, eighty percent or more of the EMI parents and for eight of the nine behaviors, eighty percent or more of the LD parents said they sometimes or often noticed positive changes in their child's at-home behaviors. (See Table 10 for the frequency distributions.)

The four at-home behaviors that large proportions of EMI parents rarely or never noticed positive changes were "Has improved in his/her study habits." (35 percent); "Is better able to express him-/herself." (28 percent); "Is less likely to act impulsively, allows him-/herself time to think before acting." (28 percent); and "Is confident in what he/she says." (21 percent).

Among LD parents, on only one item was there a high proportion of rarely or never responses: "Does not give up as quickly when trying to do something that is difficult to do." (27 percent).

While there were some apparent differences between the reports of EMI and LD parents in the percents reporting positive changes occurring rarely or never, the differences in the overall assessments of changes on each of the behaviors considered were found not to be statistically significant. By assuming equal intervals between the four response choices, mean scores were

TABLE 10

FREQUENCY IN THE OCCURRENCE OF IE STUDENT BEHAVIORS DURING THE SCHOOL YEAR AS REPORTED BY PARENTS IN PERCENT AND MEANS PER STUDENT PROGRAM ENROLLMENT AND t-TEST VALUES

Student Behaviors	Parent Reports of Frequencies in the Occurrence of Student Behaviors in Percents and Means by Student Program Enrollment and t-Test Values										
	EMI Parents (N=14)					LD Parents (N=35)					t-Test Values*
	Often	Some-times	Rarely	Never	$\bar{X}$	Often	Some-times	Rarely	Never	$\bar{X}$	
1. Shows more interest in going to school each day.	71	14	7	7	3.5	63	34	3	0	3.6	.46
2. Seems to enjoy what he/she does in school.	64	36	0	0	3.6	51	46	3	0	3.5	.95
3. Has improved in his/her study habits.	50	14	21	14	3.0	74	11	9	8	3.5	1.76
4. Does not give up as quickly when trying to do something that is difficult to do.	36	50	7	7	3.1	44	29	3	24	2.9	.57
5. Is better able to express him-/herself.	36	36	14	14	2.9	57	29	11	3	3.4	1.67
6. Seems to show more interest in things.	71	21	7	0	3.6	74	20	6	0	3.6	.22

[1] Based on a four-point frequency scale: 1=Never, 2=Rarely, 3=Sometimes, 4=Often.

*None of the t values was significant at the .05 level.

TABLE 10 CONTINUED

Student Behaviors	Parent Reports of Frequencies in the Occurrence of Student Behaviors in Percents and Means by Student Program Enrollment and t-Test Values										
	EMI Parents (N=14)					LD Parents (N=35)					
	Often	Some-times	Rarely	Never	$\bar{X}$	Often	Some-times	Rarely	Never	$\bar{X}$	t-Test Values*
7. Wants to participate in activities outside the home, more now than before.	71	21	7	0	3.6	80	9	3	9	3.6	.19
8. Is less likely to act impulsively. Allows him-/herself time to think before acting.	36	36	7	21	2.9	43	43	11	3	3.3	1.40
9. Is confident in what he/she says.	57	21	7	14	3.2	65	31	0	3	3.6	1.51

computed for each parent grouping, and the differences in means on each behavior were tested using the t-test statistic. The results are displayed in Table 10. None of the resulting t values was statistically significant.

To the question, "Have you or other members of your family noticed anything different about [your child] during this school year?", 57 percent of the EMI and 54 percent of the LD parents said they did. Positive examples were supplied by 85 percent of the EMI and 78 percent of LD parents when asked what the difference was. Most of the examples were school related. Among them were: "...more eager to go to school." "...reading improved." "...more interested in school." "...has matured, pays more attention."

A second open-ended question, "Has the way you get along with [your child] changed during the school year?", received fewer yes responses: 37 percent of the EMI and 42 percent of the LD parents. In describing ways they got along, 67 percent of the EMI and 86 percent of the LD parents gave positive examples, but few were school related. A sampling includes: "...listens to parents." "[is] attentive and understanding." "...talks more openly; tells what is on her mind." "...wants to be more independent." "...communicates better with the family."

The final set of questions focused on IE parents' familiarity with the IE program and their satisfaction with the program. Overall, half of the IE parents acknowledged familiarity with the IE program, the program "...in which your child has been participating." But there were wide differences between the two

groups of parents: EMI mothers were much less likely to be familiar with the IE program (29 percent) than LD mothers (62 percent). This difference was found to be statistically significant.[11] For the four EMI mothers who were familiar with the program, two were either satisfied or very satisfied with the program; the other two were not. Eighteen of the twenty-one LD mother who were familiar with the IE program said they were satisfied or very satisfied.

On the basis of the evidence presented above, this last project objective was achieved.

Comparative Data on Parents' Report

In order to establish a set of data for the purpose of comparison and not for considerations of program efficacy per se, it was decided to obtain reports from control parents on at-home student behaviors, information on family interaction and reports of others on IE program satisfaction: the content of the parent interview schedule.

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[11] The chi-square statistic was computed for the following table:

Parent Familiarity With IE

Sp. Ed. Prog.	IE Parents Yes	No	
EMI	4	10	14
LD	21	13	34
	25	23	48

$X^2=4.38$ df=1 P=.036

Table 11 displays means of the frequency-of-occurrence of at-home student behaviors as reported by both experimental and control parents, grouped by student special education program enrollment. Among EMI parents, none of the reported student behaviors varied significantly between the two study groups: the difference between means for each of the nine behaviors was not statistically significant as measured by the t-test. Similarly, for seven of the nine behaviors, differences between the two study groups, i.e., the LD parents, were not statistically significant. However, significant differences in means, as measured by the t-test, were found for the following two at-home behaviors:

> "Is less likely to act impulsively. Allows him-/herself time to think before action."
>
> "Is confident in what he/she says."

The experimental parents (LD) mentioned more frequent occurrences of positive behavior than did the control parents. In the first of these two behaviors, 86 percent of the experimental parents in contrast to 72 percent of the control parents said their child was <u>often</u> or <u>sometimes</u> less likely to act impulsively.

For the second behavior, 97 percent of experimental parents (LD) as compared to 72 percent of control parents indicated that their child was <u>often</u> or <u>sometimes</u> confident in what he/she said.

Fifty-seven percent of experimental parents (EMI) as compared to 44 percent of control parents said that they or another member of their respective families had noticed something different about their child during the school year. The percents of LD parents giving the same answer were approximately the same: experimentals, 54 percent; controls, 50 percent. For both sets of comparisons,

TABLE 11

MEANS OF THE FREQUENCY OF OCCURRENCE OF STUDENT BEHAVIORS DURING THE SCHOOL YEAR AS REPORTED BY PARENTS PER STUDY GROUP BY STUDENT PROGRAM ENROLLMENT AND t-TEST VALUES

Student Behaviors	Parent Reports of Student Behaviors in Means of Frequencies of Occurrence Per Study Group by Student Program Enrollment and t-Test Values					
	EMI Parents			LD Parents		
	Exp. $\bar{X}$	Cont. $\bar{X}$	t-Test Values	Exp. $\bar{X}$	Cont. $\bar{X}$	t-Test Values
1. Shows more interest in going to school each day.	3.5	3.6	.29	3.6	3.7	.65
2. Seems to enjoy what he/she does in school.	3.6	3.4	.94	3.5	3.5	.08
3. Has improved in his/her study habits.	3.0	3.2	.59	3.5	3.4	.49
4. Does not give up as quickly when trying to do something that is difficult to do.	3.1	2.7	1.21	2.9	2.7	.77
5. Is better able to express him-/herself.	2.9	3.3	1.22	3.4	3.2	.96
6. Seems to show more interest in things.	3.6	3.4	.76	3.6	3.5	.55
(N=)	(14)	(19)		(35)	(36)	

[1] Based on a four-point frequency scale: 1=Never, 2=Rarely, 3=Sometimes, 4=Often.

TABLE 11 CONTINUED

Student Behaviors	Parents Report of Student Behaviors in Means of Frequencies of Occurrence Per Study Group by Student Program Enrollment and t-Test Values					
	EMI Parents			LD Parents		
	Exp. $\bar{X}$	Cont. $\bar{X}$	t-Test Values	Exp. $\bar{X}$	Cont. $\bar{X}$	t-Test Values
7. Wants to participate in activities outside the home, more now than before.	3.6	3.5	.63	3.6	3.6	.19
8. Is less likely to act impulsively. Allows him-/herself time to think before acting.	2.9	3.2	.93	3.3	2.8	2.03*
9. Is confident in what he/she says.	3.2	3.2	.04	3.6	3.1	2.39*

*Statistically significant at or below the .05 level.

the differences were not statistically significant.[12] A comparison of responses of control parents per program group is presented in footnote 12. As may be observed, these differences were not statistically significant.

Of those responding affirmatively to having noticed changes in their child's behavior, 86 percent of the EMI experimental parents and 100 percent of the EMI control parents provided positive answers to the question of what was different, and more often than not, it was school related.

Among the LD parents responding, 78 percent of experimentals and 67 percent of controls offered positive examples, again, mostly school related.

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[12] The chi-square statistic was computed for each of the following tables:

You or others noticed anything different?

Study Groups	EMI Parents Yes	No	
Exp.	8	6	14
Cont.	8	10	18
	16	16	32

X^2=.50 df=1 P=NS

Study Groups	LD Parents Yes	No	
Exp.	19	16	35
Cont.	18	18	36
	37	34	71

X^2=.13 df=1 P=NS

Control Parents

Sp. Ed. Prog.	Yes	No	
EMI	8	10	18
LD	18	18	36
	26	28	54

X^2=.15 df=1 P=NS

39

Parents of EMI children were less likely than parents with LD children to suggest that the way they got along with their child changed during the school year. Among the former (EMI), 27 percent of the experimental and 12 percent of the control parents did; but among the latter (LD), 42 percent of the experimental parents and 44 percent of the control parents agreed that there was change. None of these differences between study groups was statistically significant.[13] On the other hand, the difference between control parents, grouped by student program enrollment, was statistically significant. (See footnote 13.)

Eighty-six percent of the LD experimental parents gave positive descriptions of changes in their interactions as did 75

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[13] The chi-square statistic was computed for each of the following tables:

Change in interaction between parent and child?

Study Groups	EMI Parents Yes	No	
Exp.	3	8	11
Cont.	2	15	17
	5	23	28

$X^2=1.01$ df=1 P=NS

Study Groups	LD Parents Yes	No	
Exp.	14	19	33
Cont.	16	20	36
	30	39	69

$X^2=.03$ df=1 P=NS

Control Parents

Sp. Ed. Proj.	Yes	No	
EMI	2	15	17
LD	16	18	36
	18	35	53

$X^2=5.5$ df=1 P=.02

percent of the LD control parents.[14]

The final set of questions on the interview schedule, dealing with familiarity with IE varied between the study groups. The same percent of EMI as LD control parents said they were familiar with the IE program: 22 percent. The experimental parents were asked the same question, but it was qualified by identifying IE as the program in which their child was enrolled. As noted above, even with this, only 29 percent of the EMI experimental parents acknowledged familiarity with IE. Thus across study groups, EMI parents were equally less informed.

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[14] Two of the three EMI experimental parents and one of the two control parents gave positive descriptions of the ways in which their getting along with their child changed during the school year.

Among LD parents, difference between study groups in program familiarity was statistically significant given the high level of experimental awareness, 62 percent, and the low level within the grouping of control parents interviewed, 22 percent.[15]

The follow-up question for control parents asked: "From what you have heard, how satisfied would you say parents of children in the Instrumental Enrichment Program are?" A five-point Likert-type scale was used to measure levels of satisfaction, from very dissatisfied to very satisfied. Seventy-five percent of the EMI parents said they believed that parents with children in the IE program were very satisfied or satisfied; 88 percent of the LD parents responded similarly. By converting the responses scale scores, computing means for each

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[15] The chi-square statistic was computed for each of the following tables:

Familiarity with the IE program

Study Groups	EMI Parents Yes	No	
Exp.	4	10	14
Cont.	4	14	18
	8	24	32

X^2=.17 df=1 P=NS

Study Groups	LD Parents Yes	No	
Exp.	21	13	34
Cont.	8	28	36
	29	41	70

X^2=11.37 df=1 P<.01

Control Parents

Sp. Ed. Prog.	Yes	No		
EMI	4	14	18	X^2=0
LD	8	28	36	df=1
	12	42	54	P=.02

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group, and testing for difference between means using t-test, the results were not statistically significant (t=.46 df=10 P=NS). The EMI control parents had a higher mean score, 4.25, than did the LD control parents, 3.87.

One conclusion to be drawn from the review of control parent responses from the telephone survey is that the student benefits from the regular special education program apparently were not much different from those realized by students receiving IE, given the nature of the questions asked the parents in both groups.

SUMMARIES AND CONCLUSIONS

The results presented above are summarized in the following for each of the objectives measures.

Obj. 1: Increase academic growth in reading and mathematics.

This objective was not achieved. There were no statistically significant pre-post differences in the performances of the two study groups in either special education program on the standardized achievement subtests administered in December, 1987 and December, 1988.

With the exception of the performance of the EMI experimental cohort on the math subtest, both study groups registered an increase in posttest mean scores over pretest mean scores.

Obj. 2: Increase students' abstract thinking abilities.

Complete data measuring this project objective will not be available until next year when the study groups will be posttested on a cognitive abilities test.

Pretest results show statistically significant differences on one subtest favoring EMI controls, but between the LD study groups, experimental students achieved statistically significantly higher mean scores on all three subtests.

Obj. 3: Reduce the frequency of absences from school.

This objective was achieved in part. The LD experimental students were absent-from-school statistically significantly fewer days during the Fall, 1988 semester than were LD control students. Among the EMI study cohorts, the controls were absent fewer days, but not statistically significantly so.

Obj. 4: Increase the number of students enrolled in mainstream classrooms.

The attainment of this objective cannot be assessed as mainstreaming appears to be a fairly ubiquitous practice at the middle school level as may be judged from the data gathered during the last two evaluations of IE. Among the control students in both special education cohorts, mainstreaming in one or more classes was experienced by all students. Ninety-three percent of the experimentals in both special education cohort shared the same experience.

Obj. 5: Positive changes in teachers' attitudes toward IE instructional practices and teachers' perception of positive changes in students' behaviors will occur.

Both parts of this objective were achieved. In measuring the former, teachers were asked to rate twenty-three IE instructional practices retrospectively: before and after their involvement with IE. Eighty-five percent or more of the teachers evaluated 18 of the 23 instructional practices either <u>good</u> or <u>excellent</u> in the post-involvement ratings phase. On all items, differences between pre-post ratings were indicative of positive change and statistically significant.

In the second section, teachers were asked to evaluate changes occurring in students' attitudes and behaviors during the school year. Seventy percent or more of the teachers answered affirmatively to positive changes occurring in 19 of the 34 behaviors rated. On only two did a higher proportion of teachers express either uncertainty or disagreement rather than agreement to positive changes occurring in student behavior during the school year.

Obj. 6: Students' parents will report positive changes in students' behaviors.

This objective was achieved. The results of telephone interviews found that eighty percent of the IE parents contacted said that they noticed positive changes occurring either <u>sometimes</u> or <u>often</u> on most of nine at-home student behaviors on which they were questioned. More specifically, this was true for five students behaviors among EMI parents and for eight student behaviors among LD parents.

Thus, the IE project partially succeeded in achieving this year's set of six efficacy criteria: project objectives.

With the completion of the third annual evaluation, it is possible to review historically what has been the project's success or lack of success in achieving its goals in those areas associated with the annual evaluation, i.e., the stated efficacy criteria, and it is also possible to call attention to what appear to be recurring findings--all this vis-a-vis the middle school student cohorts.

Perhaps the most salient concern of educators is student growth in academic areas. For the most part, the evidence from the last two evaluations has shown growth in reading and mathematics for both study groups. Yet, the same evaluation data also revealed that the students benefiting from IE program practices have not performed significantly better on the Stanford Diagnostic subtests than their peers: those who were not recipients of IE program practices.

However, there appear to be some program benefits that are manifested in differential performances on certain measures of abstract thinking ability. In Year II, LD experimentals (middle school) did achieve significantly higher posttest scores than LD controls on 4 of 9 subtests of the Learning Potential Assessment Device, an instrument developed by those responsible for creating IE and used in the IE assessment process.[16] [The EMI experimentals

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[16] See Reuven Feuerstein et al, L.P.A.D. Manual, Learning Potential Assessment Device, Jeruselem: Hadassah Wizo Canada Research Institute, n.d. Also see the appendix, in last year's report, op. cit., p. 40.

surpassed EMI controls on 2 of 9 subtests.] Also in the same year, both experimental cohorts, LD and EMI, achieved statistically significantly higher posttest scores on 7 of 9 subtests in comparison to similar performances on 6 of 9 subtests for LD controls, but on only 1 of 9 subtests for EMI controls. Of course, it should be noted the controls are not instructed on materials that the LPAD assess; the experimentals are.

Though lacking a posttest assessment of performances of the current samples of project participants on the Cognitive Abilities Test which measures abstract thinking ability, the initial (pretest) performances of LD experimentals on three Cognitive Abilities subtests were statistically significantly higher than those of the LD controls. If the two study groups were of equal ability at the beginning of the school year, then this difference could be attributed to the efficacy of IE.[17] The administration of the posttest in Year IV will be a proper test of this hypothesis.

The project's effectiveness in altering attendance patterns at the middle school level has varied by program group. In Year II and Year III, LD experimentals were absent statistically significantly fewer days in each of the fall semesters than were LD controls. However, there were no statistically significant differences between EMI experimental and EMI control cohorts for the same two fall semesters. Pre- and post project enrollment

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[17] Notwithstanding the fact that among the EMI students, controls achieved statistically significant higher scores on one of the three subtests.

comparisons drawn during Year I for experimental students showed fewer days absent in spring-to-spring and fall-to-fall comparisons, but none statistically significantly so for either LD or EMI cohort. (No attendance data were provided for control students in Year I.)

The use of mainstreaming as a project goal had significance in the first two years of evaluation since differences were found at the elementary and high school level. None was found at the middle school level, where mainstreaming appears to be the norm. With only middle school students now comprising the study sample, mainstreaming will not be included as a project efficacy criterion in future evaluations.

The strong support teachers expressed for IE's program practices in the initial evaluation through their positive assessments was repeated in the assessments made by teachers in Year III. The comparison of the assessments made by Year I teachers with thoughts of first year teachers in Year III indicated some slightly lower ratings which were not in themselves significant.

To more generalizing closed-end questions, approximately ninety percent of the Year III teachers agreed that mediated learning changed the way they taught, and the use of IE made them better teachers. Almost as many felt the use of IE also changed the way they interacted with students. There was much less confidence in IE's superiority to the normal special education program in how much of a difference IE makes on student learning in the content areas. Unbeknown to the teachers surveyed, their observations were supported by the performances of

the two study groups on standardized achievement tests.

The positive reports on program practices and other general pedagogical concerns were matched with expression of positive, significant changes occurring in students' attitudes and behavior. But here again, teachers were largely in disagreement or uncertain regarding improved student attendance and punctuality. The absent-from-school data collected in the three evaluations support IE teachers' observations.

The positive responses of the samples of IE parents and IE teachers, who were surveyed either through telephone interviews or by the use of self-administered questionnaires, contributed to almost the entirety of Year I's evaluation report findings and to one-third of Year III's report findings. In both evaluation reports, the efficacy criteria relating to parent and teacher attitudes were met, and since, in the first evaluation report, not much else was presented, a good deal of optimism regarding the project's future efficacy was generated.

Although not included as a part of Year III's evaluation design, samples of control parents were also selected randomly and interviewed via telephone. The reason for doing this was to generate data which would serve as a basis for evaluating, by comparison, the responses of experimental parents to the same set of questions.

The findings presented in the body of the report, but not summarized above, affirm that control parents articulated equally positive reports about their children. There were no statistically significant differences on all nine closed-end

questions between EMI experimentals and EMI controls. There were equally none on seven of the nine questions asked parents of the LD students. Thus, any expression of optimism for IE based on IE parent interviews should be tempered in light of the responses made by control parents.

RECOMMENDATIONS

On the basis of the project's performance during the last three years, the following recommendations are made:

1. The IE project should retain the same middle school experimental and control classes for the next two school years: 1989-91.

2. The next evaluation report should be issued at the end of the three year period encompassing the tenure of the current experimental and control student cohorts--in August, 1991. With further improvements in the gathering and accurate recording of evaluation data, the substantive issue of whether the project achieved its goals may then be addressed with confidence in the evaluation data.

3. Evaluation activity for the 1989-90 school year should be devoted to monitoring the collection of data in four area:

   a. Academic Growth: Student performance on the Stanford Diagnostic math and reading subtests (Posttest data).

   b. Abstract Thinking Skills: Student performance on the Cognitive Abilities Test (Posttest data).

   c. Locus of Control: Student performance on the School Attitude Measure (Pretest data).

   d. Attendance: Student absences from School (Post measure).

4. Efforts should be made to inform IE students' parents, especially parents of EMI students, as to the purposes and practices of the IE program.

5. This report should be reviewed by the program staff, and, as recommended last year, "...where needed, instructional and/or programmatic changes be developed and implemented for the IE program's improvement."